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**Ultrahigh mol. wt. polyolefin porous film prodn. - involves forming soln. of polyolefin, extruding, removing some solvent from moulding obtd. stretching and removing remaining solvent**

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Number of Countries: 007 Number of Patents: 006

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
JP 63273651	A	19881110	JP 87108169	A	19870430	198851 B
US 4873034	A	19891010	US 88223123	A	19880722	198950
EP 355214	A	19900228	EP 88306777	A	19880722	199009
JP 93075011	B	19931019	JP 87108169	A	19870430	199344
EP 355214	B1	19940518	EP 88306777	A	19880722	199420 N
DE 3889659	G	19940623	DE 3889659	A	19880722	199426 N
			EP 88306777	A	19880722	

Priority Applications (No Type Date): JP 87108169 A 19870430; DE 3889659 A 19880722; EP 88306777 A 19880722; US 88223123 A 19880722

Cited Patents: 1.Jnl.Ref; EP 160551; EP 193318; JP 63273651

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
JP 63273651	A		7		
US 4873034	A		6		
EP 355214	A	E			

Designated States (Regional): DE FR GB IT NL

JP 93075011 B 5 C08J-009/00 Based on patent JP 63273651

EP 355214 B1 E 10 C08J-005/18

Designated States (Regional): DE FR GB IT NL

DE 3889659 G C08J-005/18 Based on patent EP 355214

Abstract (Basic): JP 63273651 A

Prepn. comprises preparing a soln. of ultrahigh molecular wt. polyolefin with wt. average molecular wt. at least  $5 \times 10^5$  power 5, extruding the soln. with quenching to up to the gelling temp. of the soln., removing at least 10 wt% of the solvent in the obtd. gel type moulding to make the content of ultrahigh molecular wt. polyolefin 10-90 wt%, stretching the gel type moulding at up to the m.pt. of the ultrahigh molecular wt. polyolefin plus 10 deg.C and then removing the residual solvent.

The ultrahigh molecular wt. polyolefin is pref. polyethylene with ethylene as main body. Quenching is carried out at least 50 deg.C/min. by cooling the die. The temp. up to the gelling temp. is up to 90 deg.C, pref. 50-60 deg.C. The stretching temp. is within the dispersing temp. of the crystal to m.pt of the crystal. The solvent is non-volatile solvent such as paraffin oil.

USE/ADVANTAGE - For battery separators, electrolytic condenser membranes, ultra precision filter membranes, ultrafilter membranes, porous films for moisture permeable water proof cloth, etc. because the porous film has high strength and high pressure-resistance due to its uniform and thick form. It does not cause swelling or necking-in and has good processability in lamination, with nonwoven cloth, etc.

Abstract (Equivalent): EP 355214 B

A process for producing a microporous ultra-high-molecular-weight polyolefin membrane having a thickness of at least 10  $\mu\text{m}$ , a void volume of at least 30% and a pore diameter of 0.001 to 0.5  $\mu\text{m}$ , and said polyolefin having a weight-average molecular weight of  $5 \times 10^5$  or more, said process comprising the steps of: a) forming a gel-like sheet from a solution of said polyolefin; b) removing at least 10 wt.% of solvent from said gel-like sheet so that said gel-like sheet contains 10 to 90 wt.% of said polyolefin; c) stretching said gel-like sheet at a temperature equal to or lower than that which is 10 deg C above the melting point of said polyolefin so as to produce an area; draw ratio of greater than tenfold; and d) removing the residual solvent from the stretched product, characterised in that said gel-like sheet is formed in step (a) by extruding said solution of said polyolefin from a die; said solution being rapidly cooled at a rate of at least 50 deg C/min to its gelation temperature or below before extrusion from said die.

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Abstract (Equivalent): US 4873034 A

Microporous ultra high mol. wt. polyolefin membrane is produced from a soln. of polyolefin of mol. wt. 500,000. Process comprises (a) extruding soln. from a die, cooling it rapidly to its gelation temp. or below before extrusion to form a gel-like sheet; (b) removing 10 wt.% or more of solvent from the sheet so that it contains 10-90 wt.% of polyolefin; (c) stretching it at 10 deg.C or less above polyolefin m.pt.; and (d) removing residual solvent.

USE - As battery separator, electrolytic capacitor separator, other filter, moisture-permeable waterproof clothes, reverse osmosis membranes, ultrafilters, microfilters etc., of uniform thickness.

Title Terms: ULTRAHIGH; MOLECULAR; WEIGHT; POLYOLEFIN; POROUS; FILM; PRODUCE; FORMING; SOLUTION; POLYOLEFIN; EXTRUDE; REMOVE; SOLVENT; MOULD; OBTAIN; STRETCH; REMOVE; REMAINING; SOLVENT

Derwent Class: A17; A94; J01; L03

International Patent Class (Main): C08J-005/18

International Patent Class (Additional): B01D-071/26; B29C-047/78;

B29C-055/02; B29K-023/00; B29K-023-00; B29K-105/04; B29K-105-04;

B29L-007/00; C08J-009/28; C08L-023/02; C08L-023-04

File Segment: CPI

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2452 2489 2506 2507 2514 2537 3251 2585 2629 2630 2653 2654 2667 3256

2718 2723 3270 2739 3276 2819 2820

Polymer Fragment Codes (PF):

\*001\* 014 03- 034 041 046 047 13- 332 357 369 398 402 405 414 415 427 435  
440 447 448 450 451 477 49- 491 494 51& 53& 532 533 535 540 55& 551  
567 568 575 58& 583 589 595 596 60- 604 608 623 624 627 664 665 688  
726

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